MAXDATA PLATINUM 5220 Server

User's Manual

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1 Setting up the System

Server Position

Please take note of the following criteria for creating a practical and safe workplace when setting up your computer:

⚠ The system can be used anywhere the temperature is suitable for people. However, rooms with humidity over 70 %, and dusty or dirty areas are not appropriate. In addition, do not expose the server to any temperatures over +30 °C or under +10 °C.

⚠ Make sure that the cables connecting the server to peripheral devices are not tight.

⚠ Make sure that all power and connection cables are positioned so that they are not trip hazards.

⚠ When you save data to your server's hard disks or to a floppy disk, they are stored as magnetic information on the media. Make sure that they are not damaged by magnetic or electromagnetic fields.

⚠ Because the electronics in your computer can be damaged by jarring, no mechanical devices should be placed on the same surface as the server. This is especially important for impact printers whose vibrations could damage the hard disk.

⚠ Please take care to ensure a free air flow to the server at all times. Do not block the ventilation slots of the server case and particularly the power supplies. An insufficient air flow may damage the server and / or it's components.

⚠ ATTENTION

In order to fully separate the server from current, the power cord must be removed from the wall outlet.

Connecting the System

Back Panel Connectors

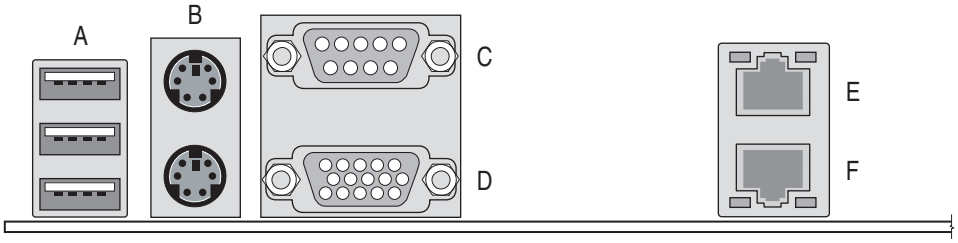

Figure 1. Back Panel Connectors

A. USB 1, 2, 3
B. Mouse (top), Keyboard (bottom)
C. Serial A
D. Video
E. NIC 2 (1 GB)
F. NIC 1 (1 GB)

The NIC LEDs at the right and left of each NIC provide the following information.

Table 1. NIC LEDs

LED Color	LED State	Description
Left LED	Off	No network connection is in place
	Solid Green	Network connection is in place
	Blinking Green	Transmit/receive activity
Right LED	Off	10 Mbps connection (if left LED is on or blinking)
	Solid Green	100 Mbps connection
	Solid Amber	1000 Mbps connection

Front Panel Controls and Indicators

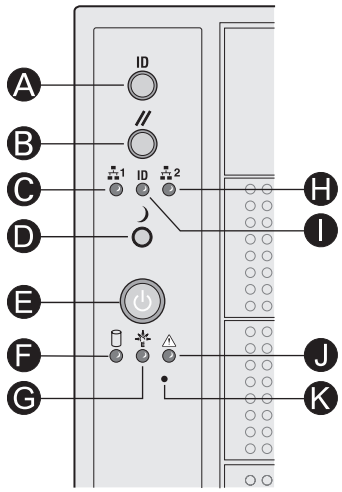

Figure 2. Pedestal Controls and Indicators

A. ID Toggle Switch
B. Reset Button
C. NIC 1 Activity LED (green)
D. Sleep Button
E. Power Button
F. Hard Drive Activity LED (bi-color)
G. Power/Sleep LED (green)
H. NIC 2 Activity LED (green)
I. ID LED (blue)
J. Status LED (bi-color)
K. NMI Button

Descriptions of the front panel LEDs are listed in the following table.

Table 2. Front Panel LED Description

LED Name	Color	Condition	Description
Power/Sleep LED	**Green**	**ON**	Power On
	Green	**BLINK**	Standby/Sleep (S1)
		OFF	Off (also Sleep S4)
Status	**Green**	**ON**	System Ready
	Green	**BLINK**	System ready, but degraded: some CPU fault, DIMM killed
	Amber	**ON**	Critical alarm: Critical power module failure, critical fan failure, voltage (power supply), voltage and thermal fault
	Amber	**BLINK**	Non-critical failure: Redundant fan failure, redundant power failure, non-critical power and voltage
		OFF	System not ready: Post error / NMI event / PCI or terminator missing
Hard Drive Activity	**Green**	**BLINK**	Hard drive activity
	Amber	**ON**	Fault
		OFF	No activity
NIC 1 Activity	**Green**	**ON**	Linked
	Green	**BLINK**	LAN activity
		OFF	Idle
NIC 2 Activity	**Green**	**ON**	Linked
	Green	**BLINK**	LAN activity
		OFF	Idle
ID LED (rack only)	**Blue**	**BLINK**	Server identification; Toggled by ID button or software
		OFF	Server identification; Toggled by ID button or software

2 Chassis Description

Feature Summary

Table 3. Feature Summary

Feature	Description
Peripheral Bays	3 multi-mount 5.25 peripheral bays
Drive Bays (6 + 4) bay layout	One hot-swap drive bay for up to six SCSI drives. Optional hot-swap drive bay for up to four SCSI drives. Supports up to 10 drives
Expansion Slots	Six full-length PCI expansion slots are available.
Form Factor	5U Tower, convertible to rack mount
Power Delivery	One redundant 730-W power supply with an integrated cooling fan. Optional second redundant power supply is available.
Cooling	Four hot-swap, redundant chassis fans: • 2 120-mm fans • 2 92-mm fans **Note:** You need to install an Intel® management module for the fans to be redundant.

Chassis Front View

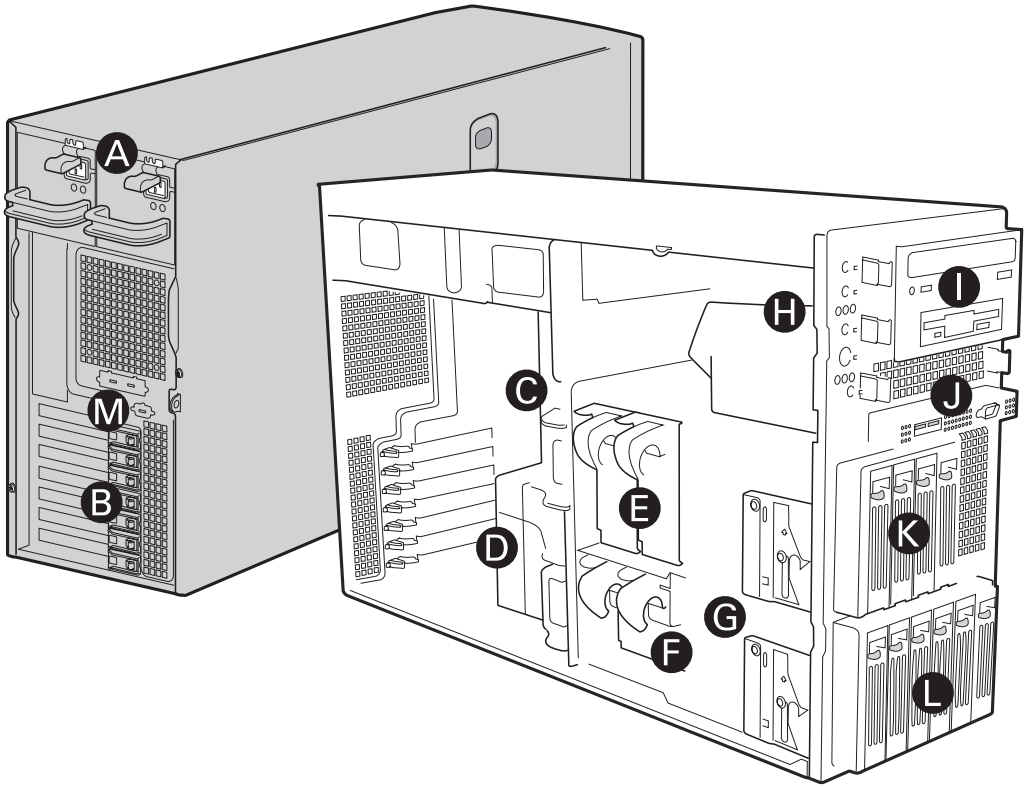

Figure 3. MAXDATA PLATINUM 5220 Front View

A. Power supply

B. PCI Add-in Card Panel

C. I/O Ports

D. Air duct

E. 120-mm hot-swap, redundant chassis fans

F. 92-mm hot-swap, redundant chassis fans

G. Drive cage release mechanisms

H. Front panel controls and indicators

I. Three 5.25-inch removable media drive bays

J. Front Panel USB/Serial B

K. Hot Swap Drive Cage – 4 Drive (optional)

L. Hot Swap Drive Cage – 6 drive

M. ICBM or SCSI Knockout

Descriptions of the front panel LEDs are listed in the following table.

Table 4. Front Panel LED Descriptions

LED Name	Color	Condition	Description
Power/Sleep LED	Green	ON	Power on
	Green	BLINK	Standby/Sleep (S1)
		OFF	Off (also Sleep S4)
Status	Green	ON	System ready
	Green	BLINK	System ready, but degraded: some CPU fault, DIMM killed
	Amber	ON	Critical alarm: Critical power module failure, critical fan failure, voltage (power supply), voltage and thermal fault
	Amber	BLINK	Non-critical failure: Redundant fan failure, redundant power failure, non-critical power and voltage
		OFF	System not ready: Post error/NMI event/PCI or terminator missing
Hard drive activity	Green	BLINK	Hard drive activity
	Amber	ON	Fault
		OFF	No activity
NIC1 activity	Green	ON	Linked
	Green	BLINK	LAN activity
		OFF	Idle
NIC2 activity	Green	ON	Linked
	Green	BLINK	LAN activity
		OFF	Idle
ID LED (rack only)	Blue	BLINK	Server identification;Toggled by ID button or software
		OFF	Server identification;Toggled by ID button or software

Chassis Rear View

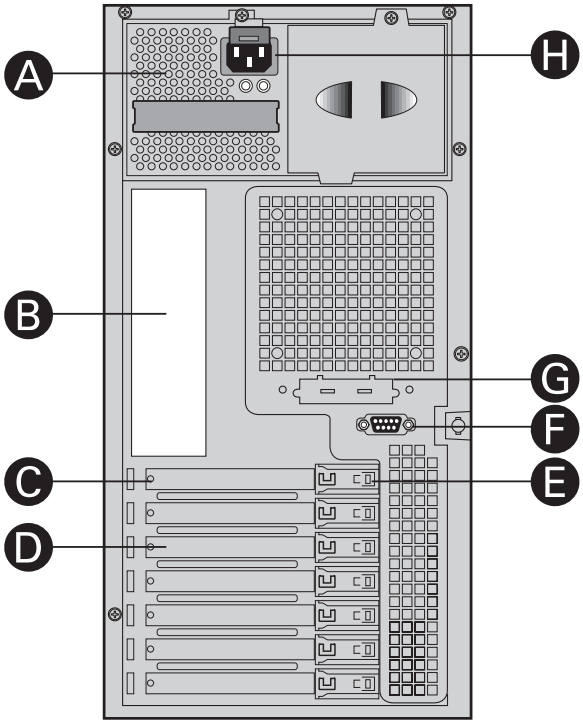

Figure 4. MAXDATA PLATINUM 5220 Chassis Rear View

A. Removable Power Supply

B. I/O Ports

C. Expansion Slot Covers

D. PCI Add-in Card Panel

E. PCI Card Latch

F. Rear Serial B Connector

G. ICBM or SCSI Knockout

H. AC Power Connector

Peripherals

5.25-in Half-height Peripheral Bays

Note: One multi-purpose 5.25-in drive carrier is included with the chassis. This drive carrier can hold either a floppy drive (by removing the knock-out) or a fixed drive.

The upper bays of the server chassis are designed for removable media peripherals. Three 5.25-in, half-height drive bays are available for floppy, CD-ROM or tape drives.

3 Setting up the Chassis

This chapter describes how to set up your server chassis for the first time.

Tools and Supplies Needed

- Phillips (cross head) screwdriver (#2 bit)
- Small flat-head screwdriver
- Anti-static wrist strap (recommended)

Safety: Before You Remove the Access Cover

Before removing the access cover for any reason, observe these safety guidelines:

- Turn off all peripheral devices connected to the server.
- Turn off the server by pressing the power button on the front of the chassis. Then unplug the AC power cord from the chassis or wall outlet.
- Label and disconnect all peripheral cables and all telecommunication lines connected to I/O connectors or ports on the back of the chassis.
- Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground – any unpainted metal surface – when handling components.

Warnings and Cautions

These warnings and cautions apply whenever you remove the access cover(s) to access components inside the server. Only a technically qualified person should integrate and configure the server.

⚠ WARNINGS

The power button on the front panel DOES NOT turn off the AC power. To remove power from server, you must unplug the AC power cord from the wall outlet or the chassis.

Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cords, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

Hazardous voltage, current, and energy levels are present inside the power supply. There are no user-serviceable parts inside it; servicing should be done by technically qualified personnel.

⚠ CAUTIONS

ESD can damage disk drives, boards, and other parts. Perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground – any unpainted metal surface – on your server when handling parts.

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. Do not touch the connector contacts. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. If you place the server board on a conductive surface, the battery leads may short out. If they do, this will result in a loss of CMOS data and will drain the battery. Use a conductive foam pad if available. Do not slide board over any surface.

For proper cooling and airflow, always install the access cover before turning on the server. Operating it without the cover in place can damage system parts.

Remove Primary Access Cover

When facing the front of the chassis, the Primary Access cover is on the left-hand side for pedestal-mounted servers, and on top for rack-mounted servers.

1. Observe the safety and ESD precautions at the beginning of this chapter.
2. Power off the system and disconnect the power cable.
3. If the shipping screw is installed, remove it (letter "A").
4. Press the latch (letter "B") and slide the Primary Access Cover toward the rear of the chassis.
5. Lift the Primary Access Cover outward to remove it.

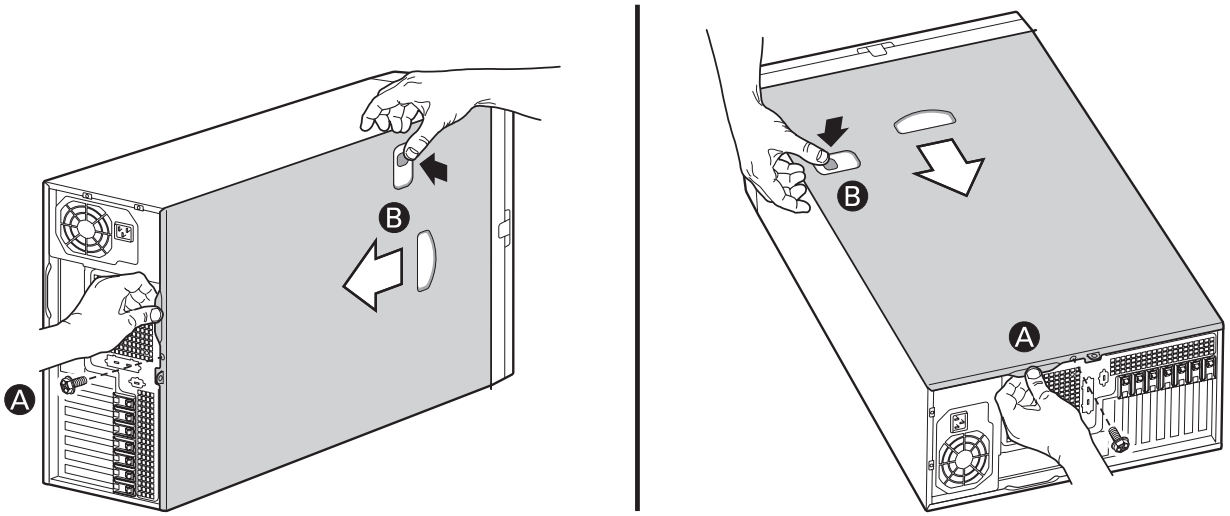

Figure 5. Removing the Access Cover

Remove Bezel Assembly

1. Release the two plastic tabs (letter "A") on the left side of the Bezel Assembly to disengage the tabs.
2. Rotate the Bezel Assembly (letter "B") no more than 40 degrees outward.
3. At a 40-degree angle, push the Bezel Assembly away from the chassis (letter "C"). If Bezel Assembly does not immediately disconnect from the chassis, then tap the left-hand side of the Bezel Assembly to disengage the bezel hooks on the right-hand side of the chassis.

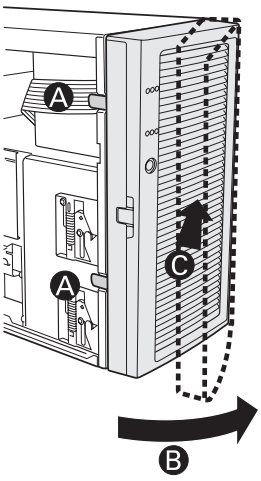

Figure 6. Removing Bezel Assembly

Install 3.5-inch Floppy, DVD or CD-ROM Drive

1. Press pair of slides inward (letter "A") to release and pull slide/filler panel assembly out of device bay.

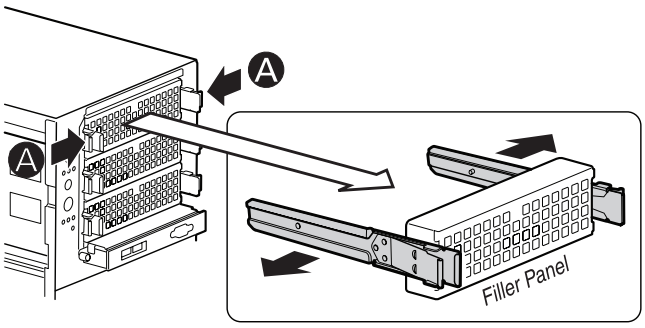

Figure 7. Removing Slide/Filler Panel Assembly from Upper Device Bay

2. Attach the slides to the drive by pressing the slides firmly into the side dimples on the drive.

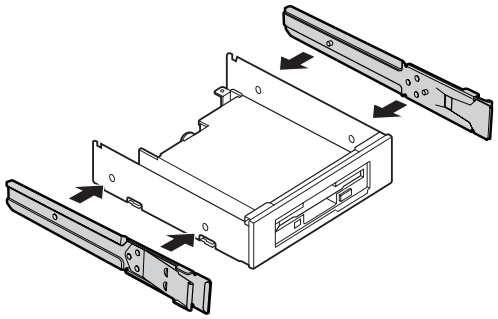

Figure 8. Installing Slides on 3.5-inch Floppy Drive

3. Insert the drive/slide assembly partially into the upper device bay. Connect power and data cables.
4. Finish inserting the drive/slide assembly into the chassis until the slides lock into place.

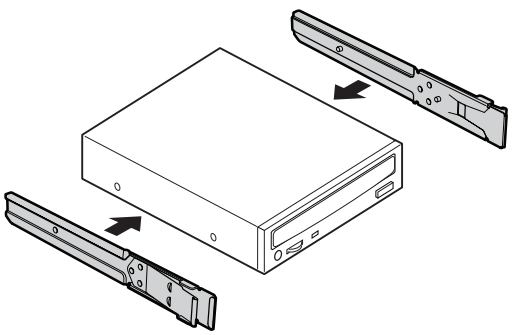

Figure 9. Installing a DVD or CD-ROM Drive

Install Hot Swap Drive(s)

1. Press in on the green latch (letter "A") at the end of the drive carrier to disengage it from the hot swap drive cage. Pull out on the black lever (letter "B") to fully open the drive carrier. When the lever reaches a fully opened position, it will push the drive carrier out from the hot swap drive cage.

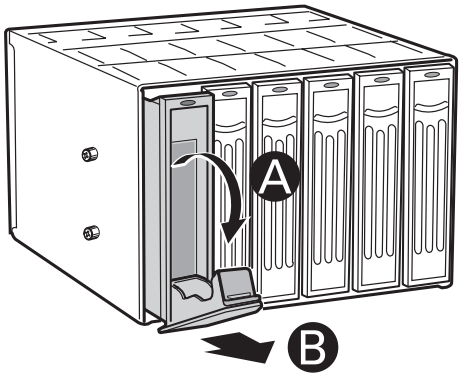

Figure 10. Releasing Drive Carrier from Hot Swap Cage

2. Slide the drive carrier out of the drive cage.
3. Remove the four screws that secure the plastic retention device to the drive carrier. Remove the plastic retention device.

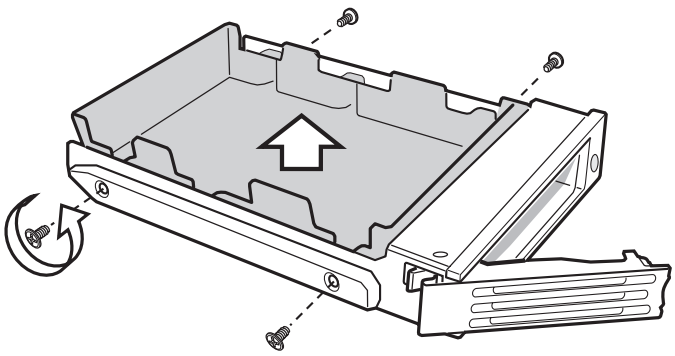

Figure 11. Removing Plastic Retention Device

4. Secure the hard drive to the drive carrier using the four screws that were formerly attached to the plastic retention device. Ensure that the connector end of the hard drive is facing the back of the drive carrier. The label side of the hard drive should be facing up in the drive carrier.

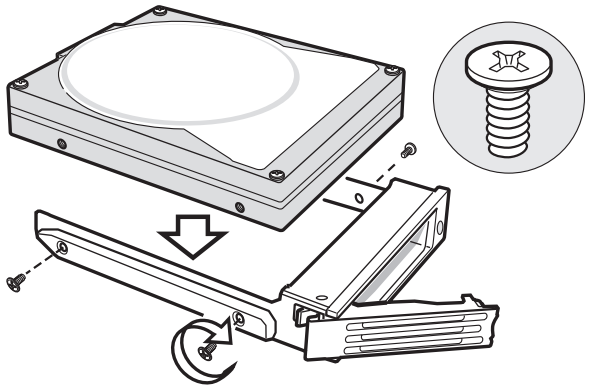

Figure 12. Securing Hard Drive to Drive Cage

5. With the black lever open, insert the drive carrier into the drive cage. Once inserted, rotate the black lever upwards to latch the drive carrier into position.

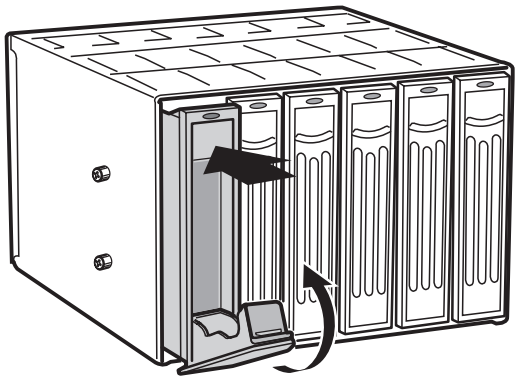

Figure 13. Inserting Drive Carrier into Drive Cage

4 Server Board Features

This chapter briefly describes the main features of the MAXDATA PLATINUM 5220 Server Board, as well as provides a list of the server board features, and diagrams showing the location of important components and connections on the server board.

Table 5 summarizes the major features of the server board.

Table 5. Server Board Features

Feature	Description
Processors	Up to two Intel® Xeon™ Processors with in an FC-mPGA4 using Socket 604, and a 800-MHz Front Side Bus (FSB)
Memory	• DDR2-400 MHz compliant registered ECC DIMMs for up to 16 GB of system memory in a dual-channel architecture. • DIMM sockets: eight 72-bit, 240-pin • Supported DIMM sizes: 256 MB, 512 MB, 1 GB, 2 GB • Dual channel architecture • Memory Mirroring and Sparing
Chipset	Intel® E7520 chipset: • Supports 800-MHz Front Side Bus (FSB) • Intel® E7520 Memory Controller Hub (MCH) • Intel® 6700PXH 64-bit PCI Hub • Intel® 82801ER I/O Controller Hub5 (ICH-5R)
I/O Control	Super I/O controller chip that provides: • Two stacked and interchangeable PS/2 compatible keyboard / mouse ports. • Three external USB 2.0 ports. • USB header providing option for additional two USB ports for front panel support. • One external serial port on the rear I/O port area (Serial A). • One serial port header to provide a second, optional serial port (Serial B). • One IDE connector supporting up to two ATA-100 compatible devices. • One standard floppy drive interface.
Video	• Integrated on-board ATI Rage XL SVGA video controller. • 8 MB SDRAM video memory • SVGA video port

continued

Table 5. Server Board Features (Continued)

Feature	Description
Hard Disk Drive	• Dual-channel LSI Logic 53C1030 Ultra320 wide SCSI controller. • Two serial ATA 150 ports. • Supported for entry-level RAID functionality (LSI Logic integrated mirroring and integrated striping).
RAID	• Integrated Intel® RAID Controller SROMBU42E through Intel® XScale® technology. Includes support for up to 256 MB of unbuffered DDR333 RAID cache (requires RAID Activation Key and either the Portable Cache Module or one 128 MB DDR333 memory DIMM. See ROMB battery backup unit support below). • LSI Logic integrated mirroring and integrated striping. • ROMB battery backup unit support (requires the Portable Cache Module accessory kit or one 128 MB DDR333 memory DIMM).
LAN	• Dual integrated 10/100/1000 MB on-board Ethernet connectors. • Two RJ-45 stacked connectors. • Intel® 82546GB
Expansion Slots	Five full-length, full-height PCI expansion slots. • Slot 1: PCI-X 64-bit / 133 MHz • Slot 3: PCI Express x4 • Slot 4: PCI Express x8 • Slot 5: PCI-X 64-bit / 133 MHz • Slot 6: PCI-X 64-bit / 100 MHz
Fans	• Six multi-speed system fan headers. • Two single-speed CPU fan headers.
Server Management	• National Semiconductor PC87431 controller to provide monitoring, alerting and logging of critical sensor information. • Intel® Light Guided Diagnostics on critical FRU devices, such as processors, memory, and power. • Front panel LCD connectors for use with the Local Control Panel. • Flexible management controller to support Standard and Advanced Management modules.
Form Factor	• SSI-EEB3.5 compliant form factor • Board size 12 inches by 13 inches

Connector and Header Locations

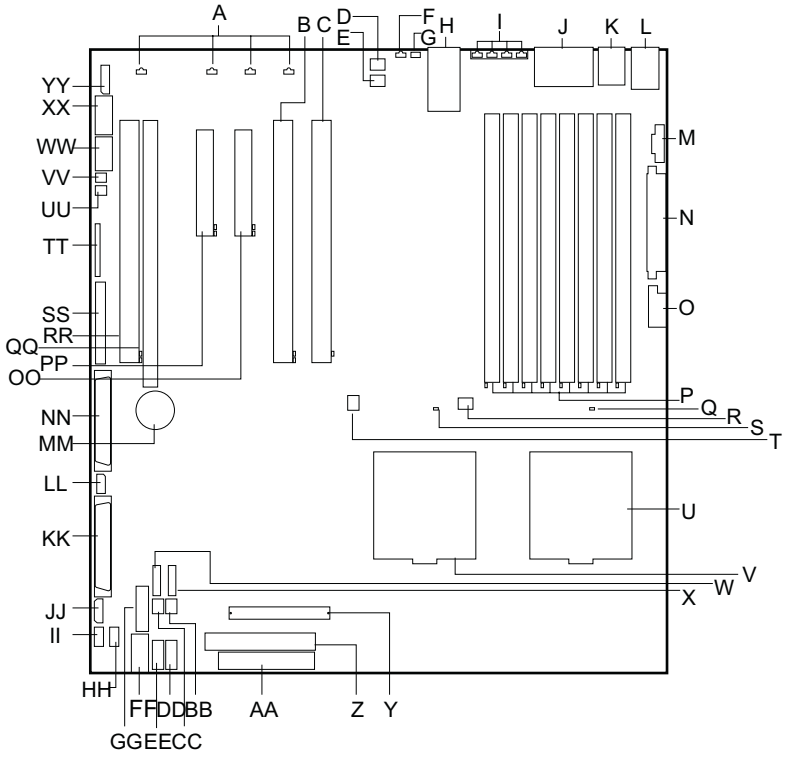

Figure 14. Server Board Connector and Header Locations

A.	Hot Plug PCI Rear Attention LEDs	**R.**	CPU1 Fan Header	**II.**	HSBP A Header
B.	PCI Slot 5 (PCI-X, 64-bit / 133 MHz)	**S.**	CPU2 Fault LED	**JJ.**	Front Panel Control LED Header
C.	PCI Slot 6 (PCI-X, 64-bit / 100 MHz)	**T.**	CPU2 Fan Header	**KK.**	SCSI Channel A Header
D.	System Fan 6 Header	**U.**	CPU1 Socket	**LL.**	IPMB Header
E.	System Fan 5 Header	**V.**	CPU2 Socket	**MM.**	RAID Activation Key Socket
F.	ID LED	**W.**	SATA A2 Header	**NN.**	SCSI Channel B Header
G.	Status LED	**X.**	SATA A1 Header	**OO.**	PCI Slot 4 (PCI Express x8)
H.	NIC 2 (top), NIC 1 (bottom) Connectors	**Y.**	Management Module Connector	**PP.**	PCI Slot 3 (PCI Express x4)
I.	POST LEDs	**Z.**	ATA-100 Connector	**QQ.**	RAID DIMM Socket
J.	Serial A (top), Video (bottom) Connectors	**AA.**	Floppy Connector	**RR.**	PCI Slot 1 (PCI-X, 64 bit / 133 MHz)
K.	Mouse (top), Keyboard (bottom) Connectors	**BB.**	System Fan 1 Header	**SS.**	Front Panel Header
L.	USB1, USB2, USB3 Connectors	**CC.**	System Fan 2 Header	**TT.**	Jumper Block
M.	Auxilliary Signal Header	**DD.**	System Fan 3 Header	**UU.**	HDD LED Header
N.	Main Power Header	**EE.**	System Fan 4 Header	**VV.**	Chassis Intrusion Header
O.	+12 V CPU Header	**FF.**	USB 3-5 Header	**WW.**	OEM RMC Header
P.	DIMM Sockets (left to right: DIMM4A, DIMM4B, DIMM3A, DIMM3B, DIMM2A, DIMM2B, DIMM1A, DIMM1B)	**GG.**	Battery	**XX.**	Serial B Header
Q.	CPU1 Fault LED	**HH.**	HSBP B Header	**YY.**	ICMB Header

Configuration Jumpers

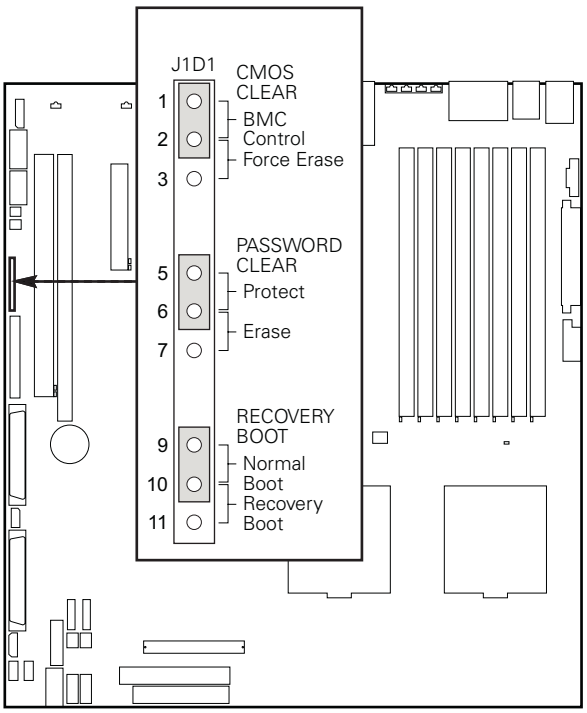

Figure 15. Configuration Jumper Location

Table 6. Configuration Jumpers

Jumper Name	Pins	What happens at system reset...
CMOS Clear	**1-2**	BMC Control: These pins should be jumpered for normal operation.
	2-3	Force Erase: If these pins are jumpered, the CMOS settings will be cleared on the next reset. These pins should not be jumpered for normal operation.
Password Clear	**5-6**	Protect: These pins should be jumpered for normal operation.
	6-7	Erase: If these pins are jumpered, administrator and user passwords will be cleared on the next reset. These pins should not be jumpered for normal operation.
Recovery Boot	**9-10**	Normal Boot: These pins should be jumpered for normal operation.
	10-11	Recovery Boot: If these pins are jumpered, the system will attempt to recover the BIOS by loading the BIOS code into the flash device from a bootable recovery device. This jumper is typically used when the BIOS has become corrupted. These pins should not be jumpered for normal operation.

Hardware Requirements

Processor

Up to two Intel® Xeon™ Processors can be used. These must have frequencies starting at 2.8 GHz using the 90 nanometer technology and utilizing an 800 MHz front side bus. Previous generations of the Intel® Xeon™ Processors are not supported.

When two processors are installed, both must be of identical revision, core voltage, cache size, and bus / core speed. When a single processor is installed, it must be in the socket labeled CPU_1.

System Memory

The MAXDATA PLATINUM 5220 Server Board includes four banks of DIMMs across two channels. Channel A consists of DIMMs 1A, 2A, 3A, and 4A. Channel B consists of DIMMs 1B, 2B, 3B, and 4B. Bank 1 (DIMMs 1B and 1A) are closest to the edge of the server board. DIMMs must be identical within each bank.

The minimum allowed memory is 256 MB, using a single 256 MB DIMM in either DIMM socket 1B or DIMM socket 1A. The system operates in single channel mode when only a single DIMM is installed. The maximum allowed usable memory is 16 GB, using 2 GB DIMMs.

DIMMs must meet the following requirements:

- Use only DDR2-400 ECC, registered DDR DIMM modules
- DIMM organization x72 ECC
- Use 240-pin DIMMs
- DIMMs of the following size can be used: 256 MB, 512 MB, 1 GB, 2 GB

The Intel® E7520 chipset includes hardware that supports memory mirroring and memory on-line sparing. Both memory mirroring and memory on-line sparing provide a way to prevent data loss in case a DIMM fails.

With memory mirroring the system maintains two copies of all data in the memory subsystem. If a DIMM fails, the data is not lost because the second copy of the data is available from the mirrored DIMM. The system will not fail due to memory error unless both the primary and the mirrored copy of the data become corrupt at the same time.

In a mirrored system, the maximum usable memory is one-half of the installed memory, with a minimum of four DIMMs installed. Since the data is duplicated across DIMMs, it means that up to four DIMMs are actively in use at any one time. If eight 2 GB DIMMs are installed, the maximum usable memory is 8 GB. The remaining four 2 GB DIMMs are used for mirroring.

Three methods for memory mirroring are available:

- Four identical DIMMs are used in DIMM sockets 1A, 2A, 1B, and 2B. If the DIMM in socket 1B fails, the DIMM in socket 2A takes over. If the DIMM in socket 1A fails, the DIMM in socket 2B takes over. See Figure 16.
- Six DIMMs are used with identical DIMMs in sockets 1A and 1B and with identical DIMMs in sockets with identical DIMMs in sockets 2A, 2B, 3A, and 3B. See Figure 17.
    - If the DIMM in socket 1A fails, the DIMM in socket 1B takes over.
    - If the DIMM in socket 2B fails, the DIMM in socket 3A takes over.
    - If the DIMM in socket 2A fails, the DIMM in socket 3B takes over.
- Eight DIMM population with identical devices in DIMM Bank 1 and Bank 2, and identical devices in Bank 3, and Bank 4. DIMMs 1A, 1B, 2A, 2B must be identical and DIMMs 3A, 3B, 4A, 4B must be identical. See Figure 18.
    - If the DIMM in socket 1B fails, the DIMM in socket 2A takes over.
    - If the DIMM in socket 1A fails, the DIMM in socket 2B takes over.
    - If the DIMM in socket 3B fails, the DIMM in socket 4A takes over.
    - If the DIMM in socket 3A fails, the DIMM in socket 4B takes over.

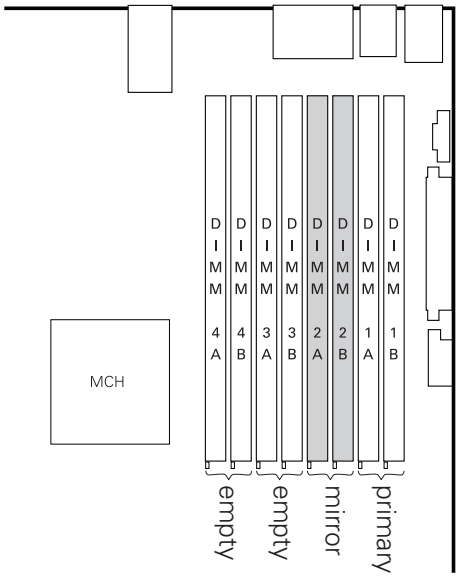

Figure 16. Four DIMM Memory Mirroring

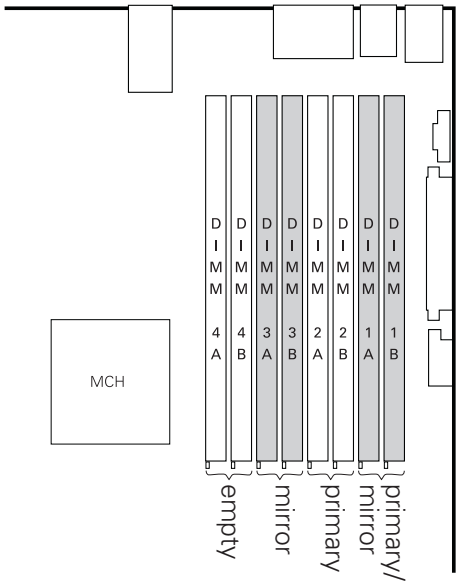

Figure 17. Six DIMM Memory Mirroring

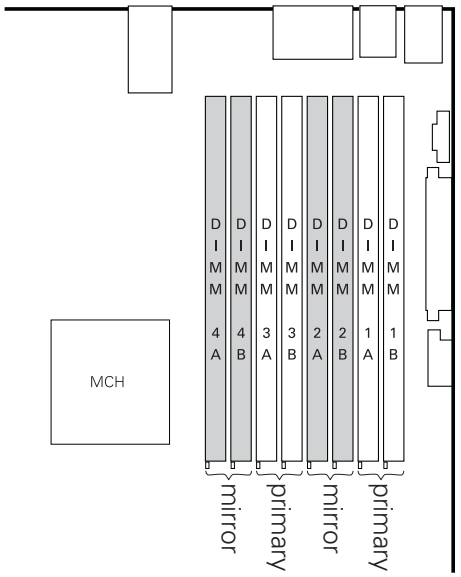

Figure 18. Eight DIMM Memory Mirroring

For memory on-line sparing, one DIMM per channel is used as the memory spare. If a DIMM begins to fail, the content of the failing DIMM is copied to the spare DIMM in that channel. When all of the data is copied to the spare DIMM, the primary DIMM is removed from service and the spare DIMM takes its place.

When memory on-line sparing is used, the spare DIMMs must be equal to or larger than the largest in-service DIMM in that channel.

5 Hardware Installations and Upgrades

Before You Begin

Before working with your server product, pay close attention to the safety information in 'Server Position' at the beginning of this manual.

Tools and Supplies Needed

- Phillips (cross head) screwdriver (#1 bit and #2 bit)
- Needle-nosed pliers
- A ruler
- Pen or pencil
- Anti-static wrist strap and conductive foam pad (recommended)

Installing or Replacing the Processor

NOTES

Use the instructions provided below to install or replace a processor instead of using the instructions that came with the processor.

CAUTIONS

Processor must be appropriate: You may damage the server board if you install a processor that is inappropriate for your server.

ESD and handling processors: Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following: (1) Touch the metal chassis before touching the processor or server board. Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the processor. (2) Avoid moving around unnecessarily.

Installing the Processor

To install a processor, follow these instructions:

1. Observe the safety and ESD precautions at the beginning of this book.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Disconnect the AC power cord from the server.
4. Remove the server's cover and locate the processor sockets.

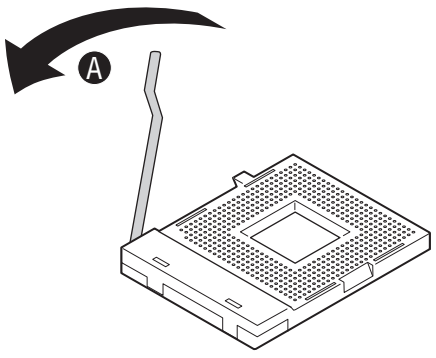

Figure 19. Opening Socket Lever

5. Locate the processor socket and raise the socket handle completely (see Figure 19).
6. Align the pins of the processor with the socket, and insert the processor into the socket.

NOTE

Make sure the alignment triangle mark and the alignment triangle cutout align correctly.

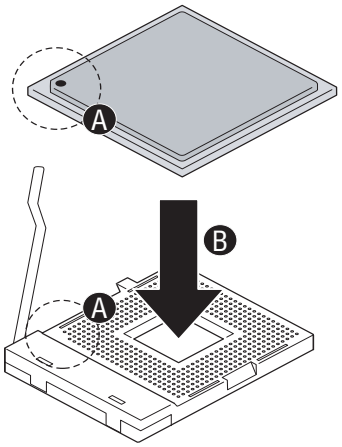

Figure 20. Inserting Processor

7. Lower the socket lever completely.

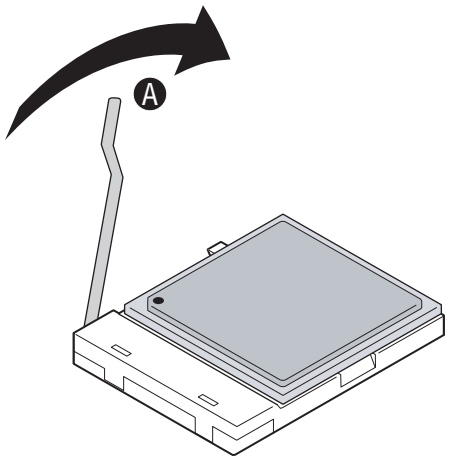

Figure 21. Closing Socket Lever

Installing the Heat Sink(s)

1. The heat sink has Thermal Interface Material (TIM) located on the bottom of it. Use caution when you unpack the heat sink so you do not damage the TIM.
2. Set the heat sink over the processor, lining up the four captive screws with the four posts surrounding the processor.
3. Loosely screw in the captive screws on the heat sink corners in a diagonal manner. Do no fully tighten one screw before tightening another.
4. Gradually and equally tighten each captive screw until each is firmly tightened.

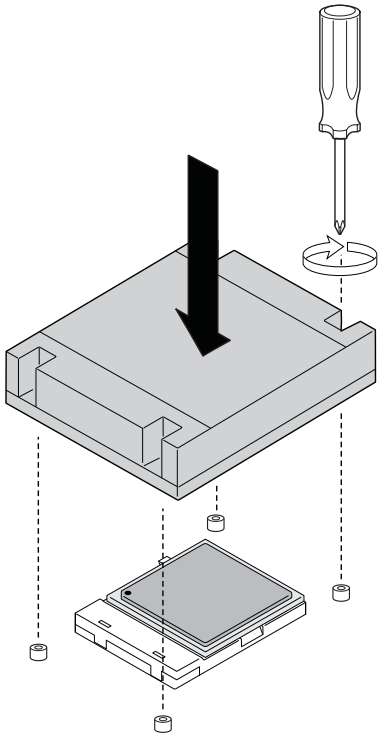

Figure 22. Installing Heat Sink

Removing a Processor

1. Observe the safety and ESD precautions at the beginning of this book.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Remove the AC power cord from the server.
4. Remove the server's cover.
5. Unplug the processor fan cable from the server board.
6. Loosen the four captive screws on the corners of the heat sink.
7. Twist the heat sink slightly to break the seal between the heat sink and the processor.
8. Lift the heat sink from the processor. If it does not pull up easily, twist the heat sink again. Do not force the heat sink from the processor. Doing so could damage the processor.
9. Lift the processor lever.
10. Remove the processor.
11. If installing a replacement processor, see "Installing the Processor." Otherwise, reinstall the chassis cover.

Installing or Removing a PCI Card

PCI cards can be installed into slots 1, 3, 4, 5, and 6. Do not attempt to install a PCI card into slot 2. Slot 2 is reserved for the RAID DIMM accessory.

If you have the hot-plug version of the board, you can make use of the PCI hot-plug features. With the PCI Hot Plug Upgrade Kit, you can hot swap PCI cards in PCI slots 1, 3, 4, and 5. Do not attempt to hot-plug a PCI card into slots 2 or 6. Slot 2 is reserved for the RAID DIMM accessory and Slot 6 is not hot-pluggable under any circumstances.

If you have not installed the PCI Hot Plug Upgrade kit you must power your server down and unplug it before attempting to add or remove any of the PCI cards.

⚠ **WARNING**

Do not attempt to hot plug a PCI card without a hot plug board.

If you have the hot-plug kit installed you must first remove the PCI slot from service before attempting to remove the card from the slot. Failure to remove the slot from service before removing the card system may result in irreversible damage to the PCI card and / or to your server board.

1. Remove chassis cover.
2. **Hot plug systems only:** If the server is powered on, use the hot-plug interface utility available through your operating system to remove the slot from service. Failure to remove the slot from service before attempting to remove or add a card may result in irreversible damage to the PCI card and / or to your server board.
3. Remove the PCI air duct from its position over the PCI slots and cards.

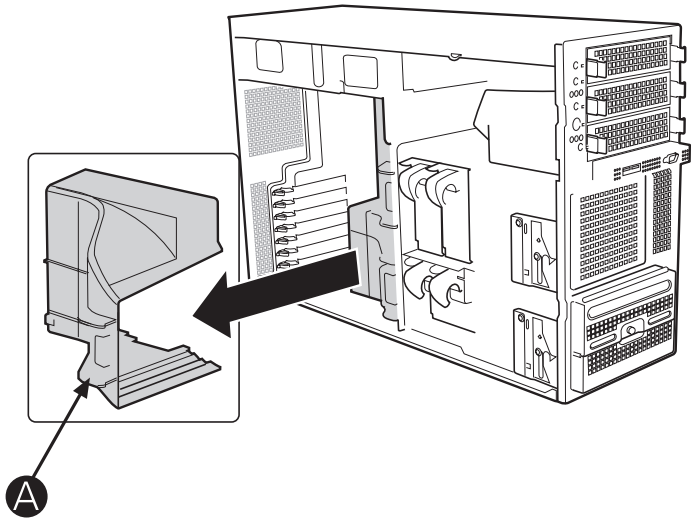

Figure 23. Removing the PCI Air Duct

4. **Hot plug systems only:** Use the hot-plug power and attention LEDs at the back of your system or next to the PCI slots inside of the server chassis to ensure it is safe to remove the card. The power LED next to a slot for which a card is to be added or removed must be OFF. If the power LED is green or blinking, do not attempt to add or remove a card in that slot. See the labels on the PCI duct for additional LED information and for LED placement inside of the chassis.

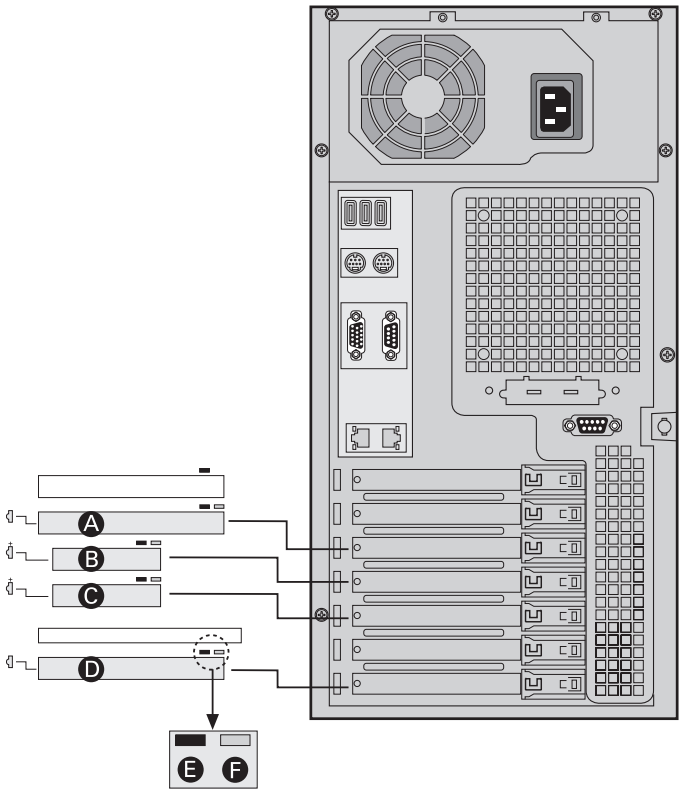

Figure 24. PCI Hot-plug LEDs at Rear of Chassis

A. PCI Slot 5 (PCI-X 64-bit / 133 MHz)
B. PCI Slot 4 (PCI Express x8)
C. PCI Slot 3 (PCI Express x4)
D. PCI Slot 1 (PCI-X 64-bit / 133 MHz)
E. Power LED (one for each PCI slot)
F. Attention LED (one for each hot-plug PCI slot)

5. Pull back on the blue or green rocker switch that holds the PCI bracket shield to the rear of the chassis to remove the shield. See letter B in Figure 25. In a standard system, the rocker switch is blue. In a hot plug system, the switch is green for any PCI slots that can be hot plugged (slots 1, 3, 4, and 5) and it is blue for slots that are not hot pluggable under any circumstances.
6. **Hot-plug systems only:** when performing a hot removal, place the hot plug curtains on each side of the card to be removed to prevent accidental contact with adjoining "live" cards.
7. If removing a card from the system, pull up on the card to remove it.
8. Insert the PCI card into the PCI slot on the server board. See letter C in Figure 25. In a hot-plug system, stand the hot-plug curtains on each side of the card to be installed and insert the card between them to prevent accidental contact with adjoining "live" cards. Press firmly on the top edge of the card until it is fully seated.

CAUTION

Press the card straight down into the slot. Tipping it in the slot while installing it may damage the card or slot.

9. Push the rocker switch up to secure the PCI card into place. See letter D in Figure 25.
10. If you needed to remove the PCI add-in card retainer to remove or install a full-length card, reinstall it. See letter A and letter E in Figure 25.

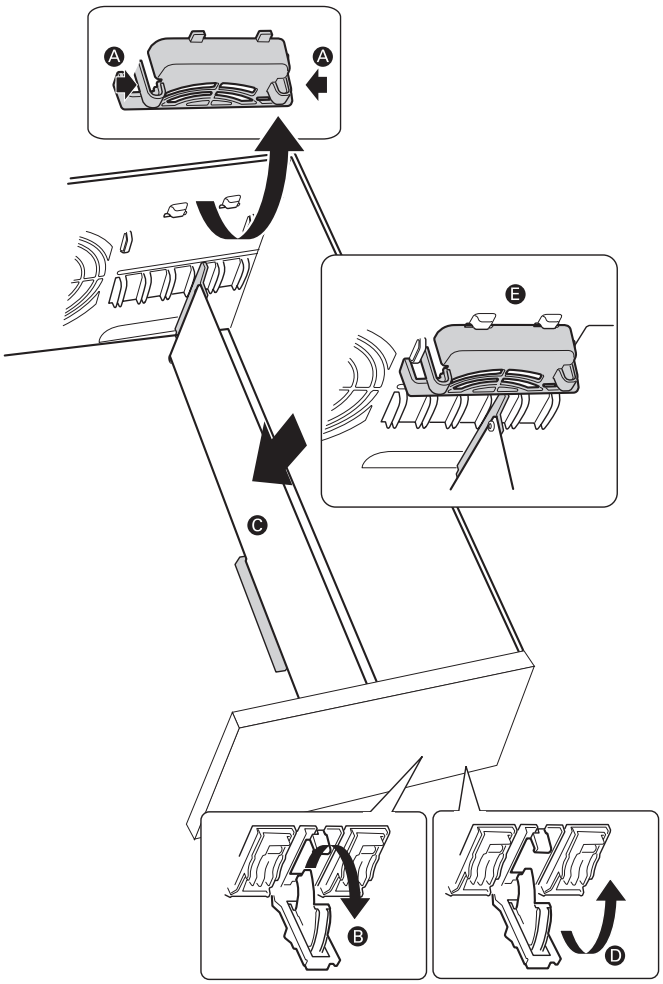

Figure 25. Installing a PCI Card

11. **Hot plug systems only:** Store the PCI curtains inside the chassis, along the side of the power supply for easy access.
12. **Hot plug systems only:** Use the hot-plug interface utility available through your operating system to "hot add" the card you just inserted.
13. **Hot plug systems only:** Watch for the power LED next to the PCI card or at the rear of the chassis to turn on (green). The amber LED should be off, to indicate normal operation.
14. Install the PCI air duct over the PCI slots and cards.
15. Install the chassis cover.

Replacing the Backup Battery

The lithium battery on the server board powers the RTC for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.

WARNING

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

VARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

OSTRZEŻENIE

Nieprawidłowa wymiana baterii grozi eksplozją. Wymieniać tylko na taki sam lub równoważny typ, zalecany przez producenta. Zużyte baterie utylizować zgodnie z instrukcjami producenta.

AVERTISSEMENT

Danger d'explosion en cas de remplacement incorrect de la pile. Remplacez-la uniquement par une pile du même type ou d'un type équivalent recommandé par le fabricant. Mettez au rebut les piles usagées en vous conformant aux instructions du fabricant.

VORSICHT

Bei falschem Einsetzen einer neuen Batterie besteht Explosionsgefahr. Die Batterie darf nur durch denselben oder einen entsprechenden, vom Hersteller empfohlenen Batterietyp ersetzt werden. Entsorgen Sie verbrauchte Batterien den Anweisungen des Herstellers entsprechend.

1. Observe the safety and ESD precautions at the beginning of this book.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Disconnect the AC power cord from the server.
4. Remove the server's cover and locate the battery.
5. Push the metal lever over the top of the battery to the side to disengate it from the battery.
6. While holding the lever away from the battery, lift the battery from its socket.

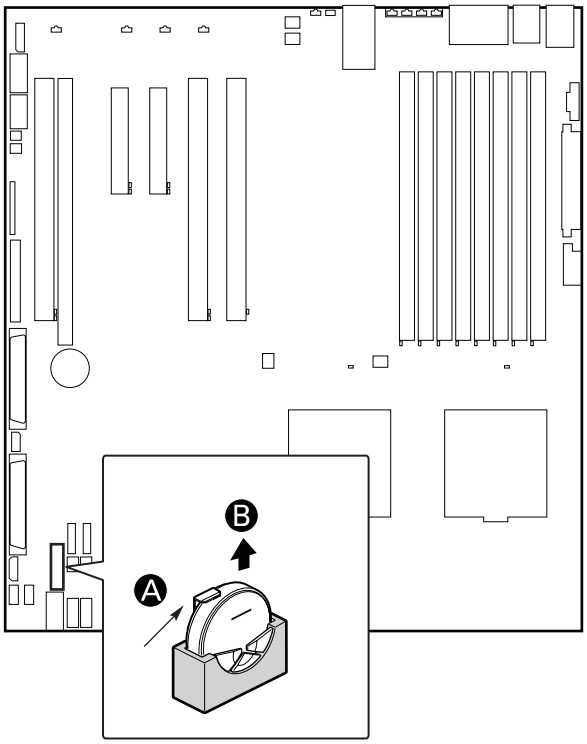

Figure 26. Replacing the Backup Battery

7. Dispose of the battery according to local ordinance.
8. Remove the new lithium battery from its package, and, being careful to observe the correct polarity, insert it in the battery socket. The negative side of the battery (indicated by the "-") must face the right side of the server board.
9. Close the chassis.
10. Run Setup to restore the configuration settings to the RTC.

6 Server Utilities

Using the BIOS Setup Utility

This section describes the BIOS Setup Utility options, which is used to change server configuration defaults. You can run BIOS Setup with or without an operating system present.

Starting Setup

You can enter and start BIOS Setup under several conditions:

- When you turn on the server, after POST completes the memory test
- When you have moved the CMOS jumper on the server board to the "Clear CMOS" position (enabled)

In the two conditions listed above, after rebooting, you will see this prompt:

```
Press <F2> to enter SETUP
```

In a third condition, when CMOS/NVRAM has been corrupted, you will see other prompts but not the <F2> prompt:

```
Warning: CMOS checksum invalid
Warning: CMOS time and date not set
```

In this condition, the BIOS will load default values for CMOS and attempt to boot.

If You Cannot Access Setup

If you are not able to access BIOS Setup, you might need to clear the CMOS memory.

Setup Menus

Each BIOS Setup menu page contains a number of features. Except for those features that are provided only to display automatically configured information, each feature is associated with a value field that contains user-selectable parameters. These parameters can be changed if the user has adequate security rights. If a value cannot be changed for any reason, the feature's value field is inaccessible.

Table 7 describes the keyboard commands you can use in the BIOS Setup menus.

Table 7. Keyboard Commands

Press	Description
<F1>	Help - Pressing F1 on any menu invokes the general Help window.
← →	The left and right arrow keys are used to move between the major menu pages. The keys have no affect if a sub menu or pick list is displayed.
↑	Select Item up - The up arrow is used to select the previous value in a menu item's option list, or a value field pick list. Pressing the Enter key activates the selected item.
↓	Select Item down - The down arrow is used to select the next value in a menu item's option list, or a value field pick list. Pressing the Enter key activates the selected item.
F5/-	Change Value - The minus key or the F5 function key is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list.
F6/+	Change Value - The plus key or the F6 function key is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboard, but it has the same effect.
<Enter>	Execute Command - The Enter key is used to activate submenus when the selected feature is a sub menu, or to display a pick list if a selected feature has a value field, or to select a sub-field for multi-valued features like time and date. If a pick list is displayed, the Enter key will undo the pick list, and allow another selection in the parent menu.
<Esc>	Exit - The ESC key provides a mechanism for backing out of any field. This key will undo the pressing of the Enter key. When the ESC key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered. When the ESC key is pressed in any sub menu, the parent menu is re-entered. When the ESC key is pressed in any major menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded.
<F9>	Setup Defaults - Pressing F9 causes the following to appear: Setup Confirmation Load default configuration now? [Yes] [No] If "Yes" is selected and the Enter key is pressed, all Setup fields are set to their default values. If "No" is selected and the Enter key is pressed, or if the ESC key is pressed, the user is returned to where they were before F9 was pressed without affecting any existing field values.
<F10>	Save and Exit - Pressing F10 causes the following message to appear: Setup Confirmation Save Configuration changes and exit now? [Yes] [No] If "Yes" is selected and the Enter key is pressed, all changes are saved and Setup is exited. If "No" is selected and the Enter key is pressed, or the ESC key is pressed, the user is returned to where they were before F10 was pressed without affecting any existing values.

7 Troubleshooting

LED Information

The MAXDATA PLATINUM 5220 Server Board includes LEDs that can aid in troubleshooting your system. A table of these LEDs with a description of their use is listed below.

Table 8. LED Information

LED Name	Function	Location	Color	Description
ID	Aid in server identification from the back panel	Front panel and board rear left corner	Blue	On = Server identification enabled
System fault	Visible fault warning	Front panel and board rear left corner	Green or Amber	• On = No Fault • Green Blink = degraded • Amber = critical error or non-recoverable • Amber blink = non-critical
IDE activity	Show IDE activity	Front panel and board left side	Green	Blinking = Activity
DIMM fault	Identify failing memory module	Inside the system, at the front of each DIMM socket	Amber	On = Fault
POST code 1–4 (LSB, Bit1, Bit2, MSB)	Display boot 80 POST code	Left rear of board	Each LED can be Off, Green, Amber, Red	See the POST code table
Fan Pack Fault	Warn on fan failure	Front center board	Amber	On = Fault
CPU 1 & 2 Fan Fault	Identify fan failure	Front center board	Amber	On = Fault
CPU 1 & 2 Fault	Identify processor failure	1″ behind processor socket	Amber	On = Fault
5v Standby	Identify 5v standby power on state	Front left board	Amber	On = 5v standby power on
Power LED	Identify the power state of the system	Front Panel	Green	• Off = Power is off (off or S5) • On = Power on or S0) • Slow Blink = Low power state (S1 – S3)

continued

LED Information (Continued)

LED Name	Function	Location	Color	Description
Hot-plug PCI Power (hot plug PCI system only)	Identify the power state for the hot-plug PCI slot	Inside the system, at the front of PCI slots 1, 3, 4, and 5	Green	• On = Power is on to the PCI slot. DO NOT REMOVE THE PCI CARD. • Off = Power is off to the associated PCI slot. • Blinking = Slot is transitioning between on and off. DO NOT REMOVE THE PCI CARD
Hot-plug PCI Attention (hot plug system PCI only)	Indicates a fault condition has occurred	Inside the system, at the front of PCI slots 1, 3, 4, and 5: At the rear of the chassis, visible from the exterior of the system (only if the hot plug PCI light pipe kit is installed)	Amber	• Off = Slot and card are functioning without error. • On = A failure has occurred. • Blinking = Slot needs attention

BIOS POST Beep Codes

The table below lists the POST error beep codes. Prior to system video initialization, the BIOS uses these beep codes to inform users of error conditions. The beep code occurs only when a critical error occurs or when the BIOS fails to boot to the operating system. Please note that not all error conditions are supported by BIOS beep codes.

Table 9. Boot Block Error Beep Codes

Number of Beeps	Description
1	Insert diskette in floppy drive A:
2	'AMIBOOT.ROM' file not found in root directory of diskette in A:
3	Base Memory error
4	Flash Programming successful
5	Floppy read error
6	Keyboard controller BAT command failed
7	No Flash EPROM detected
8	Floppy controller failure
9	Boot Block BIOS checksum error
10	Flash Erase error
11	Flash Program error
12	'AMIBOOT.ROM' file size error
13	BIOS ROM image mismatch (file layout does not match image present in flash device)
1 long beep	Insert diskette with AMIBOOT.001 File for Multi-Disk Recovery

POST Error Beep Codes

The following table lists POST error beep codes. Prior to system Video initialization, BIOS uses these beep codes to inform users on error conditions.

Table 10. POST Error Beep Codes

Number of Beeps	Description
1	Memory refresh timer error
2	Parity error in base memory (first 64 KB block)
3	Base memory read / write test error
4	Motherboard timer not operational
5	Processor error
6	8042 Gate A20 test error (cannot switch to protected mode)
7	General exception error (processor exception error)
8	Display memory error (system video adapter)
9	ROM checksum error
10	CMOS shutdown register read/write error
11	Cache memory test failed

Troubleshooting BIOS Beep Codes

Table 11. Troubleshooting BIOS Beep Codes

Number of Beeps	Troubleshooting Action
1, 2, or 3	Reseat the memory, or replace with known good modules.
4-7, 9-11	Fatal error indicating a serious problem with the system. Consult your system manufacturer. Before declaring the motherboard beyond all hope, eliminate the possibility of interference by a malfunctioning add-in card. Remove all expansion cards cards except the video adapter. • If beep codes are generated even when all other expansion cards are absent, consult your system manufacturer's technical support. • If beep codes are not generated when all other expansion cards are absent, one of the add-in cards is causing the malfunction. Insert the cards back into the system one at a time until the problem happens again. This will reveal the malfunctioning add-in card.
8	If the system video adapter is an add-in card, replace or reseat the video adapter. If the video adapter is an integrated part of the system board, the board may be faulty.

8 Technical Reference

Power Supply Specifications

730-W Single Power Supply Input Voltages

730-W Power Supply

- 100-127 V~ at 50/60 Hz; 10 A max.
- 200-240 V~ at 50/60 Hz; 5 A max.

730-W Single Power Supply Output Voltages

730-W Power Supply

The table below lists the total wattage available from the power subsystem for each voltage. If you configure your system heavily, ensure that your loads do not exceed the combined total wattage of 730 Watts.

Table 12. 730-W Power Supply System Output Capability

Voltage	Maximum Current
+3.3 V	36 A
+5.0 V	36 A
+5 V Standby	2 A
+12.0	80 A
–12.0 V	0.5 A

CAUTION

Do not exceed a combined power output of 140 Watts for the +5 V and +3.3 V outputs. Exceeding a combined 140 Watts will overload the power subsystem and may cause the power supplies to overheat and malfunction.

The expansion slots on the server board are rated for no more than 25 Watts for any one slot. The average current usage per slot should not exceed 13 Watts.

System Environmental Specifications

Table 13. Environmental Specifications

Temperature	**Non-operating**	–40 °C to 70 °C.
	Operating	5 °C to 30 °C; derated 0.5 °C for every 1000 ft (305 m) to a maximum of 10,000 ft.
Humidity	**Non-operating**	90 % relative humidity (non-condensing) at 30 °C.
Shock	**Operating**	2.0 g, 11 msec, 1/2 sine
	Packaged	Operational after an 18” free fall.
Acoustic noise		7 Bels in sound power for a typical office ambient temperature. (65 - 75 °F)
Electrostatic discharge (ESD)		Tested to 15 kilovolts (kV); no component damage.

9 Regulatory and Integration Information

Product Regulatory Compliance

Product Safety Compliance

The server board complies with the following safety requirements:

- EN 60 950 (European Union)
- IEC60 950 (International)
- CE – Low Voltage Directive (73/23/EEC) (European Union)

Product EMC Compliance

The mainboard has been tested and verified to comply with the following electromagnetical compatibility (EMC) regulations when installed in a compatible MAXDATA host system.

- EN55022 (Class A) – Radiated & Conducted Emissions (European Union)
- EN55024 (Immunity) (European Union)
- CE – EMC Directive (89/336/EEC) (European Union)

Product Regulatory Compliance Markings

This product is marked with the following Product Certification Markings:

Table 14. Product Certification Markings

CE Mark	CE

Electromagnetic Compatibility Notices

FCC (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception. All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals, that are not shielded and grounded may result in interference to radio and TV reception.

Europe (CE Declaration of Conformity)

This product has been tested in accordance to, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

Installation Precautions

When you install and test the server board, observe all warnings and cautions in the installation instructions.

To avoid injury, be careful of:

- Sharp pins on connectors
- Sharp pins on printed circuit assemblies
- Rough edges and sharp corners on the chassis
- Hot components (like processors, voltage regulators, and heat sinks)
- Damage to wires that could cause a short circuit

Observe all warnings and cautions that instruct you to refer computer servicing to qualified technical personnel.

Installation Requirements

CAUTION

Follow these guidelines to meet safety and regulatory requirements when installing this board assembly.

Read and adhere to all of these instructions and the instructions supplied with the chassis and associated modules. If the instructions for the chassis are inconsistent with these instructions or the instructions for associated modules, contact the supplier's technical support to find out how you can ensure that your computer meets safety and regulatory requirements. If you do not follow these instructions and the instructions provided by chassis and module suppliers, you increase safety risk and the possibility of noncompliance with regional laws and regulations.

Prevent Power Supply Overload

Do not overload the power supply output. To avoid overloading the power supply, make sure that the calculated total current loads of all the modules within the computer is less than the output current rating of each of the power supplies output circuits.

Place Battery Marking

There is insufficient space on this server board to provide instructions for replacing and disposing of the battery. For system safety certification, the following statement or equivalent statement may be required to be placed permanently and legibly on the chassis near the battery.

CAUTION

Risk of explosion if battery is incorrectly replaced.

Replace with only the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Use Only for Intended Applications

This server board was evaluated as Information Technology Equipment (I.T.E.) for use in computers that will be installed in offices, homes, schools, computer rooms, and similar locations. The suitability of this product for other applications or environments, (such as medical, industrial, alarm systems, test equipment, etc.) may require further evaluation.